

The majority of these uncertainties relate to the intrinsic variability and heterogeneity of the natural media to which DOE is applying engineering solutions. The types and degrees of uncertainty identified in this section are typical of those that have been encountered during the characterization and remediation of the previous 22 sites designated under Title I of UMTRCA and are similarly typical of the uncertainties associated with this stage of decision-making for remedial action projects. Based on DOE's extensive history with the remediation of uranium mill tailings sites, reasonable conservatism has been employed in characterizing the costs, resources, and impacts associated with meeting the statutory requirements of UMTRCA and NEPA. Consistent with the Council on Environmental Quality requirements for incomplete or unavailable information (40 CFR 1502.22), within this EIS DOE has explicitly identified its assumptions where information may be limited, clearly indicated the methods and models used in its analyses, and evaluated the potential relevance of incomplete or unavailable information to decision-making.

With the exception of ground water modeling, should DOE's characterization, assessment, or assumptions prove incorrect, the resultant changes in impacts would not be of a significance that would affect the principal reclamation decision of whether to relocate the tailings from their current location. Ground water modeling is an inherently subjective science that combines scientific facts with scientific observations and expert assumptions to develop a comprehensive image of a natural system, which in the case of the Moab site has been perturbed by human activities. To support the modeling effort, DOE has acquired a level of data for the Moab site consistent with its approach at the previous 22 UMTRCA sites that DOE has remediated. Additional long-term ground water and surface water sampling and analysis could be conducted and used to refine the computer model predictions and reduce uncertainties. However, further narrowing the model uncertainties by incorporating additional monitoring results would require perhaps as much as half of the predicted 75- to 80-year remediation period to validate the performance of the model (Bredehoeft 2003).

[Table 2–33](#) identifies the major areas of uncertainty, characterizes the changes that might occur in the predicted impacts, and establishes the relative effect that such changes in impacts might have on the alternatives evaluated in this EIS.

## **2.7 Other Decision-Making Factors**

### **2.7.1 Areas of Controversy**

Several areas of continuing controversy have emerged as a result of DOE's discussions and consultations with cooperating and other agencies or as a result of public comments. Some of these issues and controversies derive directly from technical or regulatory uncertainties. Other nontechnical issues and controversies have their origins in policies, perspectives, or positions endorsed by specific agencies or members of the public. For example, while DOE has not yet identified a preferred alternative, several cooperating agencies have expressed preferences.

One area of controversy involves the ground water remediation standard to be applied. Based on its calculations, DOE has determined that protection for aquatic species would be achieved at total ammonia concentrations in surface water of 3 mg/L (acute criteria) and 0.6 mg/L (chronic criteria that assumes dilution within a mixing zone). The USF&WS agrees with DOE that the target goals DOE has selected would be protective of aquatic species in the Colorado River.